Shizuo MOMOSE*: **The prothallium of Cryptogramma group of ferns****

百 瀬 静 男*: リシリシノブ群の前葉体**

The *Cryptogramma* group of ferns was first regarded by Bower (1928) as a first group of "relatively primitive genera" of his Gymnogrammoid Ferns with inclusion of *Llavea*, *Cryptogramma*, *Onychium*, *Jamesonia* and *Ceratopteris*. With exclusion of *Jamesonia* and *Ceratopteris* and inclusion of *Neurosoria*, Christensen (1938) has treated this group taxonomically with the first tribe "Cryptogrammeae" of his subfamily Gymnogrammoideae. So the common genera of this group to those authors are *Llavea*, *Cryptogramma* and *Onychium*. As regards prothallia of these genera, no account has so far appeared in literature. The present report deals with the description of prothallia of *Cryptogramma crispa*, *Onychium japonicum* and *Llavea cordifolia* based on cultured ones.

1) **Cryptogramma crispa** (L.) R. Brown Prothallia symmetrical, broad heart-shaped; wings butterfly-shaped, strongly recurved along the midrib; apex deeply cordate, inner sides of lobes round, approaching or sometimes closed each other above the bottom of sinus; lower part of the thallus sharply or truncately narrowing toward the tailed base. Protonema (the basal filament) 2–3 cells long; original cell cyrindrical, projecting beyond the basally persistent trilobed sporal coat, primary rhizoid inserted at the basal side of original cell. Wings almost equal in size, expanded abroad, wing cells square or somewhat elongate, of waved membrane; marginal cells square or elongate, arranging with minute notch, of concaved free side. Midrib distinct cushion from near the base to the very bottom of the sinus, obovate in shape, 5–6 cells thick in the heavier part, rhizomate on the basal part and archegoniate on the distal part. Rhizoids happen from the base of thallus to the middle of midrib, colourless, sometimes slightly tanned with age, delicate in texture. Archegonia produced on the distal part of midrib, neck of archegonia bends toward posterior, taper in feature, consisting of 5–7 neck cells rows at the anterior side and 4–5 neck cells rows at the posterior, dehisces reservedly. Dioecious in appearance. An-

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theridia numerously occur on small male prothallia, globose, 78–87 μ in diameter, consisting of three cells, basal cell lower than ring-cell, upper wall of the basal cell funnel-like immersed to the base or sometimes flat.

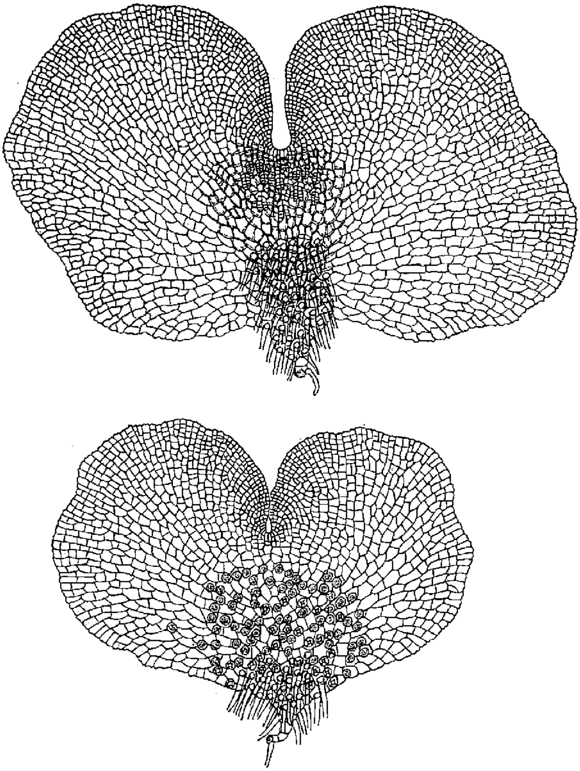

Fig. 1. *Criptogramma crispa* (L.) R. Brown (×17): above, female prothallium; below, male prothallium.

This is the fern of cold temperate region of Europe and West-Asia, ranging east to Siberia, Sakhalin, Hokkaido and northern alpine of Hondo. European material spores from the Central Botanic Gardens of the Academy of Sciences, U.S.S.R. were used for culture. Japanese fern may be called as *C. crispa* var. *japonica* Miyabe et Kudo. However the prothallium of this fern of Hokkaido is similar to that of European.

In spite of the careful examination, no hermaphroditic prothallia has been in my cultures of this species. Although I have experienced the dioecious revelation in various species of ferns, such a revelation is questionable whether it is genetical or not.

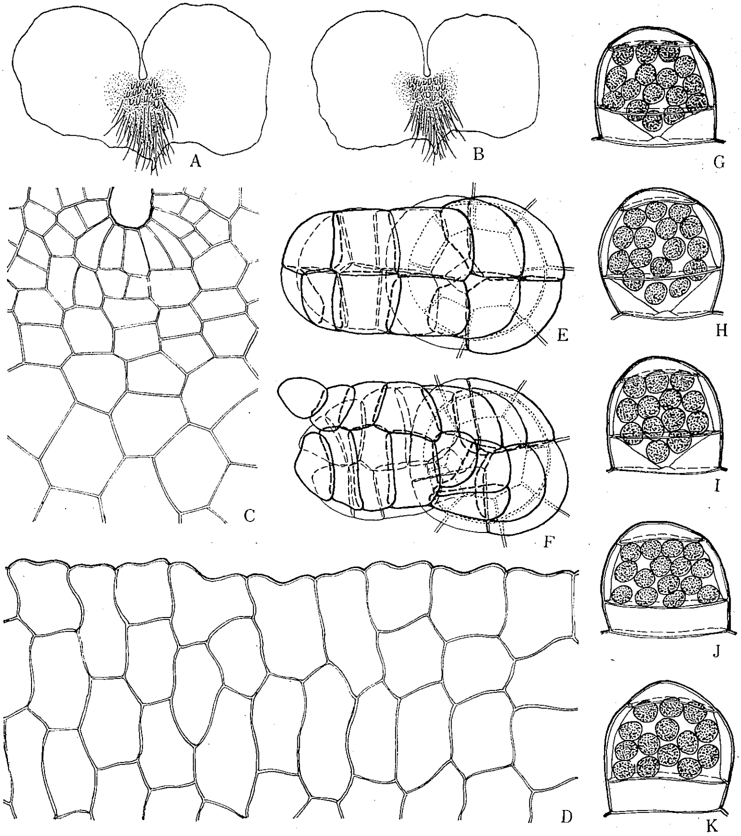

Fig. 2. *Criptogramma crispa* (L.) R. Brown: A-B, general aspects of the thallus ×5; C, apical meristem ×133; D, a part of margin ×133; E-F, archegonia × 200; G-K, antheridia ×200.

2) **Onychium japonicum** (Thunb.) Kunze Prothallia distinctly asymmetrical, broad heart-shaped, wings butterfly-shaped, recurved at the basal part of thallus; apex deeply cordate, inner sides of lobes round and devaricate above the sinus; lower part of the thallus round and steeply or somewhat truncately narrowing toward the tailed base. Protonema 2-3 cells long; original cell

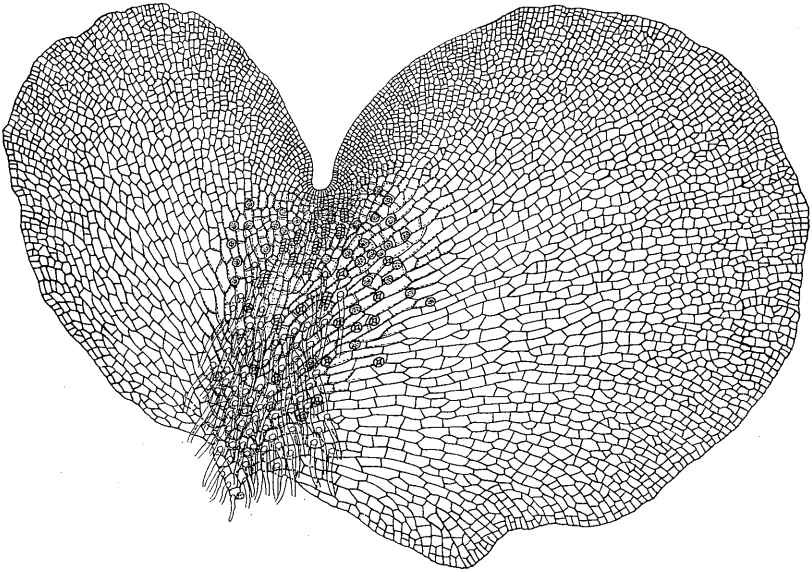

Fig. 3. *Onychium japonicum* (Thunb.) Kunze ×17.

cyrindrical, projecting beyond the persistent sporal coat, primary rhizoid inserted at the basal side of original cell. Wings unequal in size, dominant wing expanded abroad; wing cells square, sometimes of slightly waved membrane; margin of wings somewhat waved, marginal cells almost smoothly arranged, square, of almost flat or somewhat concaved free side. Midrib distinct cushion from near the base to the very bottom of the sinus, obliqued obovate, 5–6 cells thick in the heavier part, rhizomate on the posterior part, archegoniate and antheridiate on the anterior part. Rhizoids happen along the midrib from the base of thallus to the middle, colourless or slightly tanned with age. Archegonia produced along the anterior part of the midrib; neck of archegonia bends toward posterior, taper in feature, consisting of 5 neck-celled rows at the anterior and 4 neck-celled rows at the posterior, dehisces reservedly. Antheridia occur along the midrib, many on the anterior part, mixed with archegonia, globose, 77–84μ in diameter, consisting of three cells, basal cell somewhat lower than ring cell, upper wall of the basal cell funnel-like immersed to the base.

This fern is common in warm temperate rigion of Japan and ranging to China, India and Malaysia. Material spores were collected at Yawatano of Izu, Shizuoka prefecture.

3) **Llavea cordifolia** Lagasca Prothallia somewhat asymmetrical, obliquely elongate heart-shaped; wings butterfly-shaped, strongly recurved along the midrib, gutter-shaped at the lower part of thallus; apex somewhat shallowly cordate, inner sides of lobes round toward the bottom of sinus; lower part of the thallus gradually and somewhat cuneatly narrowing toward the filamentous base. Protonema 2-3 cells long; original cell cyrindrical, projecting beyond the

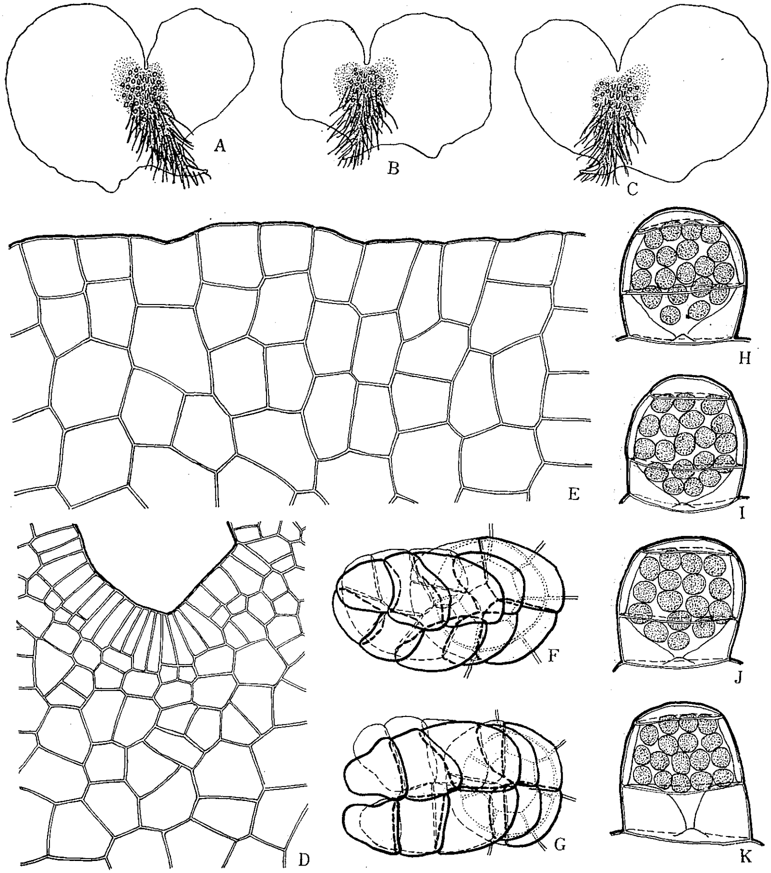

Fig. 4. *Onychium japonicum* (Thunb.) Kunze: A-C, general aspects of the thallus ×5; D, apical meristem ×133; E, a part of margin ×133; F-G, archegonia ×200; H-K, antheridia (×200).

persistent trilobed sporal coat, primary rhizoid inserted at the basal side of original cell. Wings somewhat unequal or almost equal in size, consisting of square cells, wing cells somewhat collenchymatous; margin of wings somewhat waved, marginal cells arranging with minute notch, square, with somewhat convexed or sometimes slightly concaved free side. Midrib distinct cushion from near the base to the very bottom of the sinus, large in size, elongate-obovate, 5–6 cells thick in the heavier part, archegoniate on the distal part, antheridiate on the middle part and rhizomate from the middle to the basal part. Rhizoids happen from the base of thallus to the upper part of the midrib, colourless or slightly tanned, delicate in texture. Archegonia produced on the

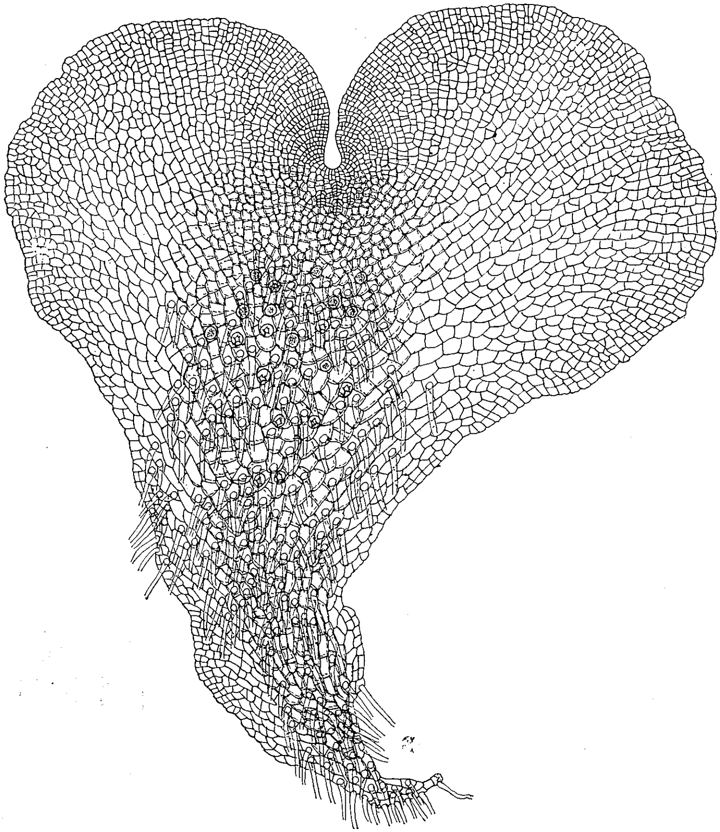

Fig. 5. *Llavea cordifolia* Lagasca × 17.

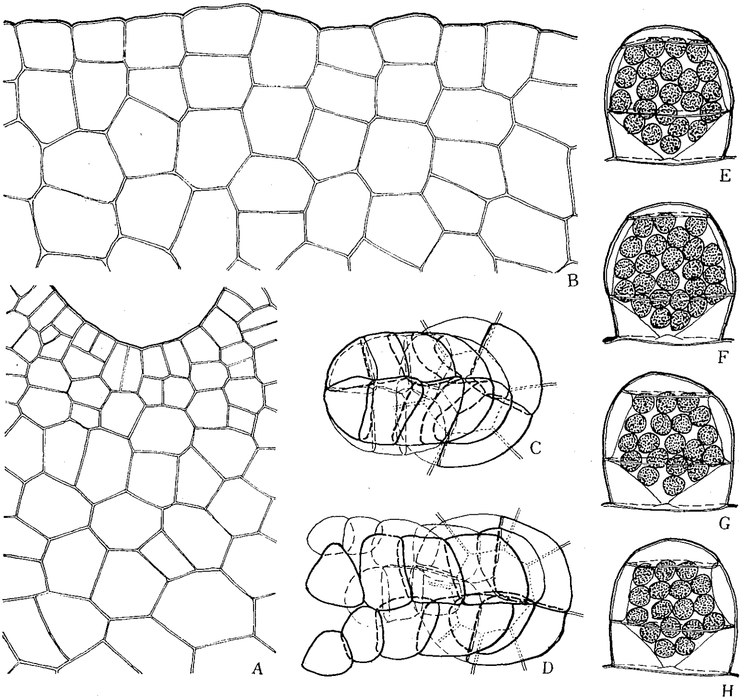

Fig. 6. *Llavea cordifolia* Lagasca: A, apical meristem ×133; B, a part of margin ×133; C-D, archegonia ×200; E-H, antheridia ×200.

distal part of the midrib, a few in number, neck of archegonia bends toward posterior, sometimes tapers in feature, consisting of 6 celled rows at the anterior side and 4-5 celled rows at the posterior side, dehisces reservedly. Antheridia occur on the middle part of the midrib, globose or somewhat ellipsoid, 80-90 μ in diameter, basal cell equal hight or lower than the ring cell, upper wall of the basal cell funnel-like immersed to the base.

This is a local fern of central Mexico to Guatemara. Spores from the "Dr. Gonçalo Sampaio" Institute of Botany of the Oporto University, Portugal, were used for culture. Very young prothallia are spatulate-plate with laterally positioned meristem and then turn into a distinctly asymmetrical heart-shape with changing of position of meristem to the apical.

摘　要

リシリシノブ群は，はじめ，Bower (1928) によって Gymnogrammoid Ferns のなかで比較的原始的な一群として設定され，Christensen (1938) によって内容の一部を変えて同亜科の第1連として分類学的に取扱われた概念であるが，両氏に共通なこの群の属はリシリシノブ属，タチシノブ属および中米特産の *Llavea* 属の3属である。これらの3属をそれぞれ代表するものとしてリシリシノブ *Cryptogramma crispa*，タチシノブ *Onychium japonicum* および *Llavea cordifolia* の前葉体を記述した。これら3属の前葉体は記述のようにそれぞれ特殊であり，リシリシノブ群の前葉体は定義し得ない。本群を含めて，いわゆる Gymnogrammoid Ferns の前葉体の記述がきわめて乏しい現状ではこれら3属の類縁に関する論議は将来に保留する。

○トキイロフデリンドウ (浅井康宏) Yasuhiro ASAI: On *Gentiana zollingerii* form. *violascens* f. nov.

フデリンドウは周知の如く，東亜の温帯に分布する越年草で，我国でも北海道から九州に至る各地に広く生育している。従来，本種の変りものとしては，津山尚博士がシロバナフデリンドウ (Journ. Jap. Bot. **16**: 502, 1940) を発表しておられる。筆者も以前より，本種の花冠が可憐なスミレ色(淡桃紫色)を呈する一品の存在を注目していたが，これにトキイロフデリンドウの名を与える。

Gentiana zollingerii Fawcett form. **violascens** Asai, f. nov.

Corolla violacea vel purpureo-rosea, cetera ut in typo.

Nom. Jap. Tokiiro-fuderindô (nov.).

Hab. Hondo; On sunny grass field under the deciduous forest of Ohsawa, Mitaka-city, Prov. Musashi. (Y. Asai, Apr. 17, 1964—Typus in TI).

(東京歯科大学)

○ミヤマシオガマの白花品 (渡辺定元) Sadamoto WATANABE: A new form of *Pedicularis apodochila*.

シオガマギク類には白花品がよくみられるが，ミヤマシオガマにも白花品がみつかった。岩手県早池峯山の蛇紋岩地帯で採集したものである。シロバナミヤマシオガマと新称する。

Pedicularis apodochila Maxim. form. **albiflora** S. Watanabe, f. nov.

Flores albi.

Nom. Jap. Shirobana-miyamashiogama.

Hab. Honshu, Prov. Rikuchû: Mt. Hayachine (S. Watanabe, June, 16, 1964—Typus in TNS).

(林野庁計画課)